THIRUVANANTHAPURAM EDUCATIONAL DISTRICT

X

PHYSICS (EM)(Answerkey)

WS2

1 Effects of Electric Current

1. a) Iron box, Electric Heater.

b) Nichrome.

c) High resistivity, High melting point, It can remain red hot for long time without getting oxidised.

2.

a) Heating effect.

b) In series

c)Low melting point.

d) Melting point of fuse wire is low. When excess current flows through the circuit due to short circuit or over loading, the fuse gets heated. As its melting point is low, it melts and the circuit is broken.

e) If we use thick wire, it may not melt and break while excess flow of current. So it is not good to use thick wire as fuse wire.

f) * The ends of the fuse wire must be connected firmly at appropriate points .

* Fuse wire should not project out of the carrier base.

* Use fuse wire having required amperage according to the load of the circuit.

* Use fuse wires made of suitable material having low melting point.

3. a) 40 W

b) $R = V^2/P$

$= 230 \times 230/40$

$= 1322.5\ \Omega$

c) 40 W bulb, Resistance is more.

4. a) Glowing with heat.

b) Tungsten

c) Ability to emit white light on being heated, high melting point, high resistivity, high ductility.

d) Prevent oxidation and vaporisation of filament.

e) Major portion of electrical energy consumed is lost in the form of heat.

5.

A	B	C
Fuse wire	Low melting point	Tin and Lead
Incandescent lamp	tungsten	Nitrogen
Heating device	nichrome	Electric energy into heat energy
Resistors in series	Increase in effective resistance	$R=R_1+R_2+R_3$
Power	Watt	I^2R
Resistors in parallel	Decrease in effective resistance	$1/R=1/R_1+1/R_2+1/R_3$

6. a) Decreases

b) Decreases

c)The intensity of light increases

7. a) Amperage is the ratio of the power of the equipment to the voltage applied.

b) Amperage = $\frac{\text{wattage}}{\text{voltage}}$

$= \frac{640}{230}$

$= 2.786 \sim 2.8A$

8. a) Resistance of the appliance,

$R = V^2/P$

$= 200x200/800$

$= 50\Omega$

Power when it is worked on 100V,

$P = V^2/R$

$= 100x100/50$

$= 200W.$

b) Power when it is worked on 50V,

$P = V^2/R$

$= 50x50/50$

$= 50W$

9. a) Light Emitting Diode

b) * As there is no filament, there is no loss of energy in the form of heat.

* Since there is no mercury in it, it is not harmful to environment.

* Less power is required for its working.